

# CISE EDUCATIONAL INNOVATION PROGRAM

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## *Program Announcement*

**Integrating Research Results into Undergraduate Courses  
and Curricula**

DIRECTORATE FOR COMPUTER AND INFORMATION SCIENCE AND  
ENGINEERING  
DIVISION OF EXPERIMENTAL AND INTEGRATIVE ACTIVITIES

**DEADLINE:** *Third Monday in March, Each Year*



**NATIONAL SCIENCE FOUNDATION**

# National Science Foundation

## Directorate for Computer and Information Science and Engineering

### Division of Experimental and Integrative Activities

#### CISE EDUCATIONAL INNOVATION PROGRAM

##### INTRODUCTION

The objective of the CISE Educational Innovation (EI) program is to stimulate innovative educational activities at the undergraduate level in CISE disciplines by encouraging the transfer of research results into the undergraduate curriculum.

##### SCOPE OF THE PROGRAM

The EI program will support the design, development, testing and dissemination of innovative approaches for increasing the effectiveness of the undergraduate learning experience in CISE disciplines (see NSF Guide to Programs, NSF 97-150) by integrating research results into undergraduate courses and curricula. The research, whether on-going or completed, may be drawn from any research project, not just those funded by the National Science Foundation.

As a minimum, the set of individuals involved in a project should be chosen to ensure an appropriate level of expertise in teaching, curriculum development, and in the relevant research areas. Addition of individuals with expertise in learning sciences, education, information technologies, cognitive sciences and/or related areas, if appropriate to the project, is encouraged. It is not required that the principal investigator or other active participants in the project be the originators of the research results which are to be transferred to the undergraduate curriculum. However, the proposal should describe the group's expertise in the research area(s).

Projects supported by the EI program are expected to act as a national model of excellence by being a prototype of educational experiences for use by a broader segment of the scientific and engineering community. Consequently successful dissemination of the project results is essential. The proposal should contain a detailed set of activities for communicating the results of the project to the CISE community. **Collaboration with other institutions, particularly as part of the dissemination activities, is highly encouraged. The formality, level, and nature of this collaboration will be the decision of the institutions concerned; however the effectiveness of the dissemination activities will be part of the evaluation criteria.** An institution submitting a proposal should also include a budget amount for at least one trip by the principal investigator to a major educational conference for presentation of results of the project.

EI awards will be for three years and are expected to range from \$300,000 to \$600,000 over the three year period. At the current level of funding for this program, we expect 4-6 proposals to be selected for support.

##### FULL PARTICIPATION OF UNDERREPRESENTED GROUPS

The Foundation encourages proposals to increase the participation of women, minorities\*, and persons with disabilities (hereinafter referred to as underrepresented groups). The level, nature and appropriateness of participation by underrepresented groups will be an important part of the evaluation.

##### ELIGIBLE PROJECT COSTS

The EI program provides support for a variety of educational activities including but not limited to the development of courses, instructional technologies, software, and other educational materials. The budget request may include a modest amount of equipment/instrumentation for faculty, staff, or students to work on the experimentation, design or development of project materials. However, it will not directly supply funds for the purchase of equipment/instrumentation to equip laboratories intended for general student use. The Directorate for Education and Human Resources offers a program: Instrumentation and Laboratory Improvement (NSF 97-29), for these purposes.

##### COST-SHARING REQUIREMENTS

Cost sharing is required. Institutions should be prepared to make a substantial commitment to the project of at least one half of the amount funded by NSF. The cost-sharing may be from any private or non-Federal public source and may be cash, or any eligible project item.

If the institution(s) can justify the acquisition of equipment/instrumentation to equip laboratories for the primary use of undergraduates enrolled in courses to be developed or modified in the proposed project as crucial to the success of the project, then some or all of such expenditures may be eligible items for cost-sharing contribution.

##### ELIGIBILITY

Proposals will be accepted from any U.S. college or university that currently offers baccalaureate degree programs in any disci-

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\* American Indian or Alaskan Native, African-American, Hispanic, or Pacific Islander

plines supported by the CISE Directorate. Only one proposal per institution will be accepted in any one year.

## EVALUATION AND REVIEW CRITERIA

### Merit Review Process

Proposals submitted in response to this program will be subject to the NEW merit review criteria approved by the National Science Board on March 28, 1997 (NSB 97-72). \* The new merit review criteria, detailed in the Chapter III of the Grant Proposal Guide (NSF 98-2), are as follows:

1. What is the intellectual merit of the proposed activity
2. What are the broader impacts of the proposed activity?

In addition to these generic review criteria, reviewers will be asked to use the following additional criteria when reviewing proposals that respond to this announcement/solicitation. These criteria are as follows:

- Potential of the project to act as a national model of excellence for the CISE community.
- Overall merit of the proposed educational activities.
- Overall merit of the research results to be transferred to the instructional domain.
- Plan for dissemination of project results.
- Qualifications, competence, and productivity of the proposed Principal Investigator, the faculty, and other project personnel.
- Level, nature, and appropriateness of participation by under-represented groups.
- Plan for project management and operation of the project.
- Plan for evaluation of the project and its impact.
- Institutional cost-sharing and related support for the project

A summary rating and accompanying narrative will be completed and signed by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are mailed to the PI/PD by the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

### PROPOSAL DEADLINE

The deadline for EI grant proposals is the third Monday in March. Proposals postmarked after this date will be returned unprocessed. Awards are planned for the summer.

### PROPOSAL FORMAT

Proposals submitted in response to this program should follow the instructions set forth in *Grant Proposal Guide* (GPG) (NSF 98-2),

using copies of the forms included in the appendices of GPG. A strict format and page limit is imposed on proposals to this program as described in GPG. Proposals not meeting these limits will be returned as inappropriate for the program.

The National Science Foundation has an obligation to monitor the operation of its award process to assess patterns of gender, race, ethnicity, or disability among proposed Principal Investigators and Project Directors. To provide NSF with the information it needs for this important task, Principal Investigators and Project Directors are requested to complete Form 1225 (NSF 98-2) and attach a single copy of this form to the original copy of the proposal. Other copies of the proposal are not to include this form. It is NSF policy that proposals that are not accompanied by a copy of this form cannot be processed.

Ten copies of the proposal are to be submitted. In order to accommodate the proposal filing system that is used at NSF the original signed copy must not be bound but rather it must be stapled in the upper-left corner and printed on one side of the page. The remaining copies can be bound if desired. Except as indicated, all copies must contain the following sections and subsections.

- I. Cover Page. The standard NSF cover page, NSF Form 1207 (NSF 98-2) must be used. The original copy of each proposal must be signed by the Principal Investigator(s) and the Authorized Organizational Representative.
- II. A Project Summary, not more than one page in length.
- III. Table of Contents with page numbers keyed to major sections of the proposal.
- IV. Project Description. (Fifteen page limit, including results from prior NSF support, which is limited to five pages. See Chapter II.D.4 of NSF 98-2.)

The structure of this section is left up to the proposing institution. It should present its case in the best possible light bearing in mind the criteria to be used by reviewers in judging the merits of the proposal. The following specific items should be addressed:

1. A description of the educational activities to be undertaken indicating the expected results and the expected national impact of the proposed activities.
2. A detailed plan for transferring project results to other institutions and the CISE community.
3. A description of activities designed to increase participation in the project activities of underrepresented groups, where appropriate.
4. A description of the duties and responsibilities of the principal investigator and all other associated personnel.
5. A description of the project management plan and the evaluation plan to assess the impact of the proposed educational programs.
6. A description of the equipment, software, and other facilities and materials currently available to support the academic programs of the department.
7. A description of the equipment, software, and other items requested for each year with itemized and total cost, and a

\* For additional information on NSF's new merit review criteria, see the Merit Review Task Force Final Report on the NSF Home Page at

rationale for its selection. For equipment, include a representative manufacturer and model number, if possible. Describe maintenance costs per year and method of computation.

**V. References Cited.** (See Chapter II.D.5. of NSF 98-2.)

**VI. Biographical Sketches**

In no more than two pages each, include the current curriculum vitae and a brief summary of the research and educational accomplishments over the past five years, for each faculty member who will be directly involved in the project.

**VII. Budget**

1. Using four appropriately labelled copies of NSF Form 1030 (NSF 98-2), one for each year of the grant and one for the total for three years, give the requested NSF budget.
2. On separate pages, using budget items similar to those on NSF Form 1030, list for each item a) Funds Needed for the Item, b) Funds Cost-Shared by Institution, and c) NSF Funds Requested (Limit: three-pages for entire period of support).

**VIII. Current and Pending Support**

Supply the information indicated in NSF Form 1239 (NSF 98-2), i.e. all current and pending research and educational project support for each investigator listed in VI. above.

## PROPOSAL SUBMISSION

Ten copies of EI grant proposals must be postmarked no later than the third Monday in March. Copies of the proposals, including the copy bearing original signatures, should be sent to:

Announcement No. NSF 98-44  
National Science Foundation PPU  
4201 Wilson Blvd.  
Arlington, VA 22230

## OTHER EDUCATIONAL PROGRAMS

*NSF Guide to Programs* (NSF 97-150) briefly describes all Foundation programs. Details of how to obtain a copy are in the next section. Some educational programs complementary to the CISE Educational Innovation Program are described below:

- The *CISE Educational Supplements* (NSF 90-154) program offers supplements to CISE-supported research grants to establish closer links between CISE-supported research and undergraduate education, and to assist in accelerating the transfer of research results into the classroom. The supplements are expected to range from \$4,000 to \$20,000 and should coincide in duration with the underlying research award. Additional information may be obtained from the Division of Experimental and Integrative Activities, Room 1160, NSF, Arlington, VA 22230 (703-306-1980).
- The *Combined Research-Curriculum Development* (NSF 98-38) program addresses the need to increase the rate at which

research advances in important technology areas are incorporated into the upper level undergraduate and graduate engineering curricula. Additional information may be obtained from the Division of Engineering Education and Centers, Room 585, NSF, Arlington, VA 22230 (703-306-1380).

- The *Undergraduate Course and Curriculum Development* (NSF 97-29) program applies to all NSF disciplines and emphasizes introductory-level courses, curricula, and laboratories, and encompasses all activities affecting the learning environment, content, and experience of instruction at this level. Additional information may be obtained from the Division of Undergraduate Education, Room 835, NSF, Arlington, VA 22230(703-306-1666).
- The *Instrumentation and Laboratory Improvement* (NSF 97-29) program supports projects to develop new or improved instrument-based undergraduate laboratory and/or field courses in science, mathematics, or engineering. Additional information may be obtained from the Division of Undergraduate Education, Room 835, NSF, Arlington, VA 22230 (703-306-1667).
- The *Undergraduate Faculty Enhancement* (NSF 97-29) program offers grants for undergraduate faculty seminars and conferences that enable groups of faculty to learn about new techniques and new developments in their fields. Awards are made to conduct seminars, short courses, workshops, or similar activities for groups of faculty members from outside the grantee institution. Additional information may be obtained from the Division of Undergraduate Education, Room 835, NSF, Arlington, VA 22230 (703-306-1669).

## ADDITIONAL INFORMATION

The brochure *Grant Proposal Guide* (NSF 98-2) and *NSF Guide to Programs* (NSF 97-150) are available at no cost from:

NSF Publications Clearing House  
P.O. Box 218  
Jessup, MD 20794-0218  
301-947-2722

For more information on the Educational Innovation Program, contact:

Program Director  
CISE Educational Innovation Program  
Division of Experimental and Integrative Activities,  
Room 1160  
National Science Foundation  
Arlington, VA 22230

Electronic mail address: eipd@nsf.gov  
Telephone number: (703) 306-1980.

The Foundation provides awards for research and educational activities in the sciences and engineering. The awardee is wholly responsible for the conduct of such research and preparation of the results for publication. The Foundation, therefore, does not assume responsibility for such findings or their interpretation.

The Foundation welcomes proposals on behalf of all qualified scientists and engineers, and strongly encourages women, minorities, and persons with disabilities to compete fully in any of the research and research-related programs described in this document.

In accordance with federal statutes and regulations and NSF policies, no person on grounds of race, color, age, sex, national origin, or disability shall be excluded from participation in, denied the benefits of, or be subject to discrimination under any program or activity receiving financial assistance from the National Science Foundation.

*Facilitation Awards for Scientists and Engineers with Disabilities* provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff including student research assistants) to work on an NSF project. See the program announcement or contact the program coordinator (703) 306-1636.

The National Science Foundation has TDD (Telephone Device for the Deaf) capability, which enables individuals with hearing impairments to communicate with the Foundation about NSF programs, employment, or general information. To access NSF TDD dial (703) 306-0090; for FIRS, 1-800-877-8339.

## **PRIVACY ACT AND PUBLIC BURDEN STATEMENTS**

The information requested on proposal forms is solicited under the authority of the National Science Foundation Act of 1950, as amended. It will be used in connection with the selection of qualified proposals and may be disclosed to qualified reviewers and staff assistants as part of the review process; to applicant institutions/grantees; to provide or obtain data regarding the application review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers as necessary to complete assigned work; and to other government agencies in order to coordinate programs. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," and

NSF-51, 60 Federal Register 4449 (January 23, 1995), "Reviewer/Proposal File and Associated Records," 59 Federal Register 8031 (February 17, 1994). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to:

Gail A. McHenry  
Reports Clearance Officer  
Division of Information Dissemination  
National Science Foundation  
Arlington, VA 22230

and to:

Office of Management and Budget  
Paperwork Reduction Project (3145-0058)  
Washington, DC 20503

Programs described in this publication are in Category 47.070 (Computer and Information Science and Engineering) in the Catalog of Federal Domestic Assistance.

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